

Many changes and variations may be made without departing from the present invention. Accordingly this invention should be considered as being limited only by the following claims.

WHAT IS CLAIMED IS;

1, A two phase navigation system for vehicles comprising:
in the first phase, operating means for visually guiding a vehicle from a zone area of its present location to a zone area of a selected destination,
said operating means visually displaying representations of the two zone areas, with the displacement between the two zone areas being representative of the distance between the two zone areas, and the angular displacement between the two being representative of the directional heading for the vehicle to follow to reach the selected destination,
the two displayed zone areas converging toward each other as the vehicle proceeds toward the selected destination, and the two displayed zone areas diverging away from each other as the vehicle proceeds away from a correct heading toward its destination,
and in a second phase, said navigation system having means for displaying detailed local information of streets-roads in the zone area of destination, thereby in the first phase, enabling the vehicle to be guided by heading direction between said two zones, and in the second phase enabling the vehicle to be guided directly to a selected destination using localized street-road information.

2. In the system of claim 1,
the addition of means providing audible instructions of directional heading during the first phase.

3. In the system of claim 1,
said initially operating means including a plurality of fixed road signs displaced apart from each other in each zone,
said signs bearing coded information identifying the zone of their location,
and a remotely operated code reader for said signs being carried by said vehicle to read the codes on said road signs as said vehicle progresses in the zone of said signs.

4. In the system of claim 1,
in the second phase, a plurality of fixed road signs displaced apart from each other in the destination zone,
said signs bearing coded information referencing detailed local road information in the vicinity of each sign,

and said vehicle adapted to support a reader for reading said coded signs as the vehicle proceeds within said destination zone, thereby to read said signs and enable the detailed referenced local content thereof to be provided for guidance of said vehicle.

5. In the system of claim 1,

A plurality of coded street signs disposed in each zone near street intersections and referencing traffic control restrictions including stop signs,

And said vehicle navigation system being provided with a sign reader to read said coded street signs and provide information regarding said traffic control restrictions, including one of visual and audible information.

6. In the system of claim 1,

said initial operating means including means for determining the distance between the location zone of the vehicle and the selected destination zone for the vehicle and enabling the degree of enlargement of the visual presentations of the two zones to be changed as the vehicle nears the destination zone.

7. In a vehicle navigation system,

A plurality of fixed road signs spaced apart from each other within each zone of an extended region subdivided into a plurality of equal sized zones,

Each sign containing a coded message identifying the zone in which it is located,

A navigation receiver for a vehicle having a visual display screen and a reader for said coded signs,

said receiver being energized by the reader to display the changeable zones of the vehicle as the different signs are read,

entry means for the receiver for entering a selected destination zone into the receiver and visually displaying said destination zone on the receiver display,

whereby the receiver displays the zone of the changeable location of the vehicle together with the zone of the selected destination, thereby to enable navigation of the vehicle by following the directional heading indicated on the display between the two displayed zones.

8. In the system of claim 7,
the addition of local navigation means for guiding the vehicle
within the destination zone,
said local navigation means comprising coded information being
provided on said signs to reference local information in the vicinity of
that sign,
said code reader reading said information and energizing said
receiver to display the local information,
thereby to enable guidance of said vehicle to specific locations
within said destination zone.

9. In the system of claim 7,
said coded signs additionally referencing information pertaining to
traffic controls and restrictions at the sign location, to thereby
display such information on the receiver screen as such sign is
read.

10. In the system of claim 7,
said system containing additional coded signs on buildings and
street addresses that identify such additional building and addresses ,
said signs being readable by the receiver reader to display such
identifications on the receiver screen.

11. In the system of claim 7,
said navigation receiver having an audible generator for audibly
announcing the information referenced by the coded signs.

12. In an electronic navigation system for guiding a movable vehicle to a selected destination by incrementally communicating the actual location of the vehicle referenced to a selected destination, and wherein said navigation system includes an on-board navigation receiver for communicating the locations of the vehicle referenced to said selected destination,

The improvement comprising:

means for detecting the changing locations of the vehicle as the vehicle proceeds from location to location along a route of travel,

a plurality of digital signs spaced apart from one another along said route, each digital sign containing information relating to that sign's location,

and a wireless reader associated with said receiver in the movable vehicle for remotely reading the information on the digital signs, and entering said information into the receiver to be communicated for navigating the vehicle.

13. In the system of claim 12,

said digital signs having passively recorded digital codes thereon,

and said reader generating a wireless beam to remotely read the recorded digital codes.

14. In the system of claim 12,

said digitally coded signs comprising active transponders being activated by said wireless reader to transmit the digitally coded information back to the receiver.

15. In the navigation system of claim 12,

said digitally coded signs containing traffic control information to be read by the reader and entered into the receiver, thereby to be communicated for aiding in the control of the vehicle.

16. In the navigation system of claim 12,

said digitally coded signs being embedded in the roadway.

17. In the navigation system of claim 12,

said digitally coded signs each containing an identification of the location where that sign is located, thereby to continually provide the receiver with the location of the vehicle as each sign is read.

18. In the navigation system of claim 12,

Said digitally coded signs containing local information referencing the area in the vicinity of each sign including streets, traffic, parking, and services.

19. In the navigation system of claim 12,

said reader comprising a laser scanner for remotely reading said digital signs, and each of said signs containing a coded identification of the location of that sign whereby the navigation system continually communicates the location of the vehicle as the vehicle proceeds from sign to sign along its route of travel.

20. In the navigation system of claim 12,

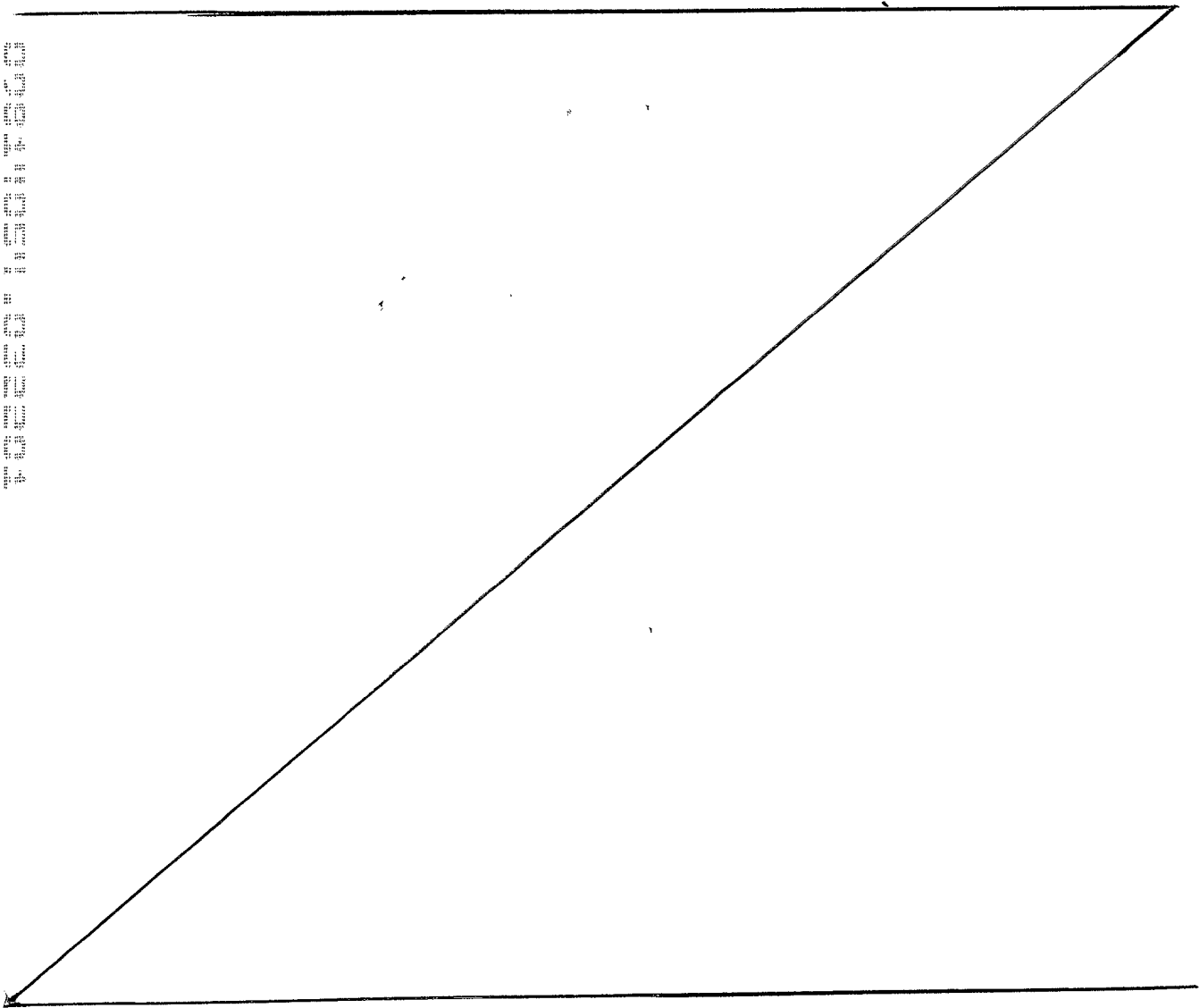
the addition of digitally coded signs being located at different street addresses with each sign containing a digital identification of that street address, whereby the

navigation receiver provides localized guidance of the vehicle directly to a selected street address

21. In the navigation system of claim 12,

said digitally coded signs referencing local information in the vicinity of each sign,

said local information including the names of a plurality of streets-roads in the vicinity of each said sign; traffic control information including speed limits, stop signs, one way streets; locations of fuel, vehicle services, and parking; and the street-road address numbers associated with said names of streets-roads.



22. A two phase vehicle navigation system for initially guiding a vehicle by heading direction from one area zone to a destination area zone, both within an extended region subdivided into a series of area zones, and wherein upon reaching the destination zone then guiding the vehicle locally within said destination zone to a specific location by communicating additional detailed information about said local destination zone,

the improvement comprising distance determining means for determining the distance between the location of the vehicle and the location of the destination,

an on-board navigation receiver having a display screen,

said receiver displaying on the screen the location of the vehicle referenced to the location of the destination,

and means for changing the scale of enlargement of the screen display of vehicle location referenced to destination location as the vehicle proceeds toward the destination location.

23. In the system of claim 21,

said receiver having an audible announcer for vocally Announcing the heading direction toward the destination.

24. In the system of claim 21,

digitally operating detection means associated with the receiver for remotely detecting traffic control information

25. In the system of claim 21,

digitally operating detection means associated with the receiver

said digital detecting means including a plurality of displaced fixed signs disposed within said zones, each sign containing a digitally coded message referencing the local traffic information at the location of that sign.

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26. A digital guidance system for movable vehicles traveling along streets and roads comprising:

A plurality of digital information sources externally of the vehicle and dispersed along the streets and roads being traveled by the vehicle,

A digital reader for said vehicle for detecting the information sources as the vehicle proceeds near each source and conveying digital information being detected within said vehicle,

Communicating means within said vehicle for receiving the digital information from said reader and communicating messages to occupants within said vehicle related to the digital information being read by the digital reader,

Said communicating means comprising one of a visual display of said messages and an audible announcement of said messages,

Said information sources comprising one of G.P.S. signals received by the reader at different locations along said streets and roads and plural digitally coded street signs disposed along said streets and roads, and detected by said reader.

27. In the system of claim 26, ,

Said vehicle having a transparent windshield for enabling an operator of the vehicle to view the streets and roads from within the vehicle,

And said communicating means including a heads-up visual display for visually presenting said messages to be viewed by the operator of the vehicle while observing the streets-roads through the transparent windshield.

28. In the system of claim 26, ,

Said digital reader and communicating means including a memory having plural messages prestored therein, said messages pertaining to street and road related information of interest to operators of vehicles traversing the streets and roads,

[illegible]

and said information sources along said streets and roads each containing a digital code corresponding to an address in said memory accessing a message related to that information source, whereby as the digital reader receives a digital code from an information source, the related message is downloaded from the memory and communicated within the vehicle.

29. A guidance and control system for movable vehicles to assist in the control of vehicles on roadways traveled by other vehicles and regulated by traffic control restrictions comprising:

Digitally operating detecting means for periodically determining the changing locations of the vehicle as the vehicle travels a roadway, and detecting preexisting traffic control restrictions at each of said locations,

A receiver interior of the vehicle and energized by said digital ly operating detecting means to communicate the detected location information in analog form interior of the vehicle, thereby to assist in the guidance of the vehicle from each location to another location,

Said digitally operating detecting means detecting traffic control restrictions at each of said locations and energizing said receiver to communicate said traffic control restrictions within the vehicle in analog form, whereby at each location the operator of the vehicle is informed of the vehicle location and also informed of any preexisting traffic restrictions .

30. In the system of claim 29,

Said digitally operated detecting means including a fixed digitally coded road sign at each location, and a laser scanner for the vehicle that reads each digitally coded road sign and energizes the receiver to communicate the location and traffic control restrictions in analog form.